

# D.A.L. DENSE MOLECULAR LIQUIDS

<p><b>C?NO ✦ STAR</b>  <b>CALCIUM NITRATE</b>  <math>\text{Ca}(\text{NO}_3)_2</math>  <b>15 - 0 - 0 + 30 CaO</b></p>	<p><b>MAGNO ✦ STAR</b>  <b>MAGNESIUM NITRATE</b>  <math>\text{Mg}(\text{NO}_3)_2</math>  <b>14 - 0 - 0 + 17 MgO + 3,5 CaO</b>  <b>11- 0 - 0 + 16 MgO</b></p>
<p><b>DUAL ✦ STAR</b>  <b>NITRATE OF</b>  <b>CALCIUM &amp; MAGNESIUM</b>  <math>\text{Ca}(\text{NO}_3)_2 + \text{Mg}(\text{NO}_3)_2</math>  <b>15-0-0+15CaO+10MgO</b></p>	<p><b>CALCIUM-NITROGEN</b>  <b>N 25+ CaO 10 + MICROELEMENTS</b>  <b>N 20+ CaO 15 + MICROELEMENTS</b></p>
<p><b>MAGNESIUM-NITROGEN</b>  <b>N 20 + MgO 7</b></p>	<p><b>CALCIUM-MAGNESIUM-</b>  <b>NITROGEN</b>  <b>N 20 + CaO 7 + MgO 5 +</b>  <b>MICROELEMENTS</b></p>
<p><b>HUMIC CALCIUM NITRATE</b>  <b>N 10 + CaO 20 + LDB HUMUS 30</b></p>	<p><b>HUMIC MAGNESIUM NITRATE</b>  <b>N 8 + MgO 10 + LDB HUMUS 30</b></p>
<p><b>HUMIC CALCIUM-MAGNESIUM</b>  <b>N 10 + CaO 10 + MgO 5 + LDB HUMUS 30</b></p>	

## IDENTIFICATION

D.A.L - STAR CALCIUM - MAGNESIUM is a group of products for nutrition - fertilization. Their processing, under our exclusive *KNOW HOW* Technology, makes these products unique and very different from their competitive, in terms of quality and accuracy of their results.

- ✓ D.A.L.-STAR are products that use **CALCIUM NITRATE** or **MAGNESIUM NITRATE** in dense liquid atom form for their foundation.
- ✓ They are products of **DENSE MOLECULAR LIQUIDS** and not solutions of CALCIUM NITRATE and MAGNESIUM NITRATE in water or suspended solutions in other solvents such as their competitors. This is the reason for their unlimited, unalterable properties. In addition, they will not undergo in suspension layers and subsidence. Finally, their chemical structure cannot be transformed. Calcium, Magnesium and Nitrogen exist in the same molecule without having a competitive activity (absence of displacement of MAGNESIUM by CALCIUM) while they can be easily absorbed by the plant.

## SIGNIFICANCE OF CALCIUM AND MAGNESIUM IN PLANT NUTRITION

### ?. CALCIUM :

- ⇒ is essential for the division and elongation of cells. The basic function is the stabilization of the cell structure.
- ⇒ influence the inflation of the protoplasm and the penetration of root cells.
- ⇒ regulates the uptake of K, Na, Mg.
- ⇒ takes effect against acidity (attach with the acid molecules, defuse them and offers protection against their toxic effects).
- ⇒ provides vital co-factors for the activation of an important number of enzymes.
- ⇒ This element moves difficulty into the plant and its redistribution from the leaves to the fruits is not easy. Thus, a continuous supply of a water soluble Calcium source such as the **LIQUID MOLECULAR CALCIUM NITRATE “CaNO STAR”**, is demanded. On the other hand, other nitrogen fertilizers such as granular Calcium Ammonium Nitrate etc., provide the element of interest under the carbonated form. However, the solubility of this form is low and totally immobilized. The consequence of these is that this form cannot be absorbed by the plant. On the contrary, the accumulation of the element occurs into the soil, and blocks the rest of the elements, causing deficiency diseases of various forms (because of the lack of nutrient elements).
- ⇒ The lack of the element Calcium is shown by the suppression of the growth of the plant, by the appearance of the slim, thin offshoots and small leaves with bad shape of chlorotic stains. Moreover, the structure of the root system cannot be developed, while the new roots are dying and the old ones are having a brown colour. The disease caused by the lack of Calcium is most popular in apple-trees(bitter pit), peppers and tomatoes. In addition, bulbs and melons with internal brown spots are also sensitive.
- ⇒ The diseases caused by the deficiency of Calcium, can be aggravated under high temperatures, drought and strong light.

## B. MAGNESIUM

- ⇒ the presence of this element is essential for the creation of the chlorophyll molecule.
- ⇒ the metabolism procedure of Phosphorus depends on this element.
- ⇒ activates various enzymes, fundamental for the creation of carbohydrates and lipids, while it helps their metabolism into the plant.
- ⇒ it is very difficult for the plant to absorb this element even when it is present in the soil. This observation is stronger for sandy soils, highly acidic or alkaline, with high concentration of Na or soils with high concentrations of Potassium where the relationship between (K) and (Mg) is not the appropriate one.
- ⇒ In situations that lack of MAGNESIUM occurs, the colour of the leaves becomes yellow, because of the reduction of the chlorophyll molecule. The symptoms first appear at the peaks and the circumference of the leaves. Afterwards, symptoms are obvious at the area between the nerves of the older leaves and those that are nearer to the ground. The colour of the tissue of the affected plants turns to be brown.

## PROPERTIES OF D.A.L. PRODUCTS

### CALCIUM NITRATE - MAGNESIUM NITRATE - CALCIUM MAGNESIUM NITRATE

- ✓ The **DENCE MOLECULAR LIQUIDS** are products of high clarity. These products comprise in their Nitrate form, Nitrogen + Calcium or Nitrogen + Magnesium or even Nitrogen + Calcium + Magnesium, **in the same drop**.
- ✓ The elements Calcium and Magnesium, are 100% assimilated with the maximum possible circulation and the best distribution in the different parts of the plant.
- ✓ They do not accumulate in the soil, undissolved. Thus, they do not block or defuse the other elements.
- ✓ They can confront with a unique way the competition between the two main elements of CALCIUM and MAGNESIUM and especially the displacement of Mg<sup>+</sup> ion by the Ca<sup>++</sup> ion.
- ✓ At the **DENCE MOLECULAR LIQUID CALCIUM MAGNESIUM NITRATE**, Nitrogen, Calcium and Magnesium exist simultaneously in the same molecule. Consequently, when the plant absorbs the Nitrogen anion, it carries also with it, the ions of calcium and Magnesium.
- ✓ At the **DENCE MOLECULAR LIQUIDS**, nitrogen exists under its Nitrate form NO<sub>3</sub>. The Nitrate is the best form ( nature ) of Nitrogen because:
- ✓ The action of the element is direct and immediate. Moreover, the activity and the limits of the active time are specific.
- ✓ It cannot be bound. On the contrary, it is available in the soil at the root-layer of the plant and in accordance with the needs, it is going to be used.
- ✓ It cannot be vaporised. Therefore, it cannot be transferred into a vapour Ammonia under soil drought conditions or under alkaline conditions.
- ✓ It has non-acidic effects and thus, it cannot influence the pH of the soil - as ordinarily happens during the Nitrification of Ammonia or Urea, or during the absorption procedure of Ammonium by the root-system of the plant.
- ✓ The farmer has the opportunity to schedule the supply of Nitrogen accordingly to the needs of his crops, by using less amount of fertilizer and increase the number of applications.

Therefore, we can control the growth of the plants with the smallest possible financial cost and the best production results.

## **D.A.L. AND SOIL IMPROVEMENT**

The **CALCIUM NITRATE**, **MAGNESIUM NITRATE** and **CALCIUM MAGNESIUM NITRATE**, beyond their nutrient role for the crops, they have precious, unique properties for the improvement of the soil conditions, soil structure and soil health generally. Instead of creating bad soil conditions such as their competitors, they have priceless soil improvement action.

- ✓ They contribute to the expansion of the soil pores. Thus, the circulation and the amount of the soil air and water (moisture) can be significantly improved, especially in the cases of heavy, irrigated soils.
- ✓ The use of the **DENSE MOLECULAR LIQUIDS (D.A.L.)** is perfectly appropriate for acidic soils, because of the elements they can supply -water soluble Calcium, Magnesium, or both, plus the Nitrogen under its Nitrate nature- .
- ✓ The application of the above elements, conversely with the products of the other forms of nitrogen ( Ammonia, Urea), they will not create an additional acidity in the soils. The use of Calcium Nitrate reduce the need of costly, laborious limings of soil, expunge the toxic effects and the accumulation of heavy metals such as Magnesium(Mg) and Aluminium(Al), while it contributes to the absorption of main micro-elements such as Iron(Fe) and Molybdenum (Mo).
- ✓ The application of **D.A.L.** at Limy soils is imperative, since the elements of Calcium and Magnesium exist in abundance at these soils but under their Carbonate form. Their solubility is very low and they are binded in insoluble groups, with such a way that they are not available for the plants.
- ✓ The application of **D.A.L.** at the saline and alkaline soils play the predominant role at the obstruction of absorbance of Soda (Na) from the root system of the plants. The Calcium ions,  $Ca^{++}$  takes the place and liberates the  $Na^{+}$  from the soil. Afterwards, the released Na can be washed out by the irrigation.

## **DIRECTIONS FOR USE**

GROUP A .

**CaNO STAR - MAGNO STAR - DUAL - HUMIC CALCIUM NITRATE**

**HUMIC MAGNESIUM NITRATE - HUMIC CALCIUM MAGNESIUM**

1. Before the coming up of the seeds, apply by pouring or by spraying on the surface of the soil and by mixing it with the soil.
2. After the coming up, apply the product by the fertirrigation. It can be done either by the introduction into the irrigation water or into the fertilizer distributor machine, or by pouring the products after irrigation in excess.
3. For settled perennials, when the application happens on Autumn or Winter, we do not have to mix the fertilizers with the soil.

▪ **General Application:**

50-150/hectare, depended on the deficiency of the elements included in the products.

▪ **Especially,**

For **Citrus Fruits**, apply 30-100kg/hectare; **Grape vines**, 30-100kg/hectare; **Apple trees**, 50-150kg/hectare. For the rest of the **Foliage Trees**, 30-100kg/hectare; **Tomatoes**, 50-150kg/hectare; **Cucumbers**, 50-120kg/hectare. For the rest of the **Vegetable Crops**, 30-100kg/hectare; **Cotton**, 30-100kg/hectare; **Alfalfa**, 50-150kg/hectare; **Cereals**, 30-100kg/hectare.

*The products of Group A can be applied supplementary on foliage, in a prpportion of 200-500g in 100 litres of water. **Particularly for applications on foliage, we recommend especially the products of Group B .***

GROUP B .

**CALCIUM NITROGEN - MAGNESIUM NITROGEN - CALCIUM MAGNESIUM NITROGEN**

**They are primarily recommended for applications on foliage.**

**They can be also applied on soil.**

▪ **General Application,**

Anticipatory, 300g into 100 litres of water can be applied.

For remedy, we can apply 500 g into 100 litres of water.

▪ **Especially,**

**Apple trees**, for resistance against bitter pit. The beggining of the applications have to be when the fall of the petals occures.Repeat every 10-14 days. Last spraying, 7-10 days before harvest.

**Pears- Peaches- Apricots**, similarly with the Apple trees. Two repetitions are enough.

**Rest of the Tree Crops**, two repetitions are sufficient. The first, one month before harvest and the second, two weeks before harvest.

**Kiwi fruit vine**, 1-4 sprayings starting at the beginning of fructification, and every 7-10 days.

**Tomatoes- Pepers**, for the control of the Bitter Pit. The applications start at the beginning of the fructification, and repeat every 10-15 days.

**Strawberries**, the applications start at the beggining of the flower formation. Repeat every 7-14 days.

- ***Depending on the circumstances, the local Agronomist will decide the best product, the amount and the way of application***